REMARKS/ARGUMENTS

Status of Claims

Claims 1-9, 19, and 29-43 have been amended.

Claims 10-18 and 20-28 have been canceled.

As such, claims 1-9, 19, and 29-43 are currently pending in this application.

Applicants hereby request further examination and reconsideration of the presently claimed application.

Election/Restriction

The Examiner has restricted new claims 31-43 on the basis that the originally elected claims 1-9, 19, 29, and 30 relate to a dimer whereas new claims 31-43 relate to a product. Applicants respectfully traverse this restriction as non-substantive and purely semantical in nature. In the Office Actions dated April 14, 2004 and January 10, 2005, the Examiner characterizes the originally elected claims (e.g., 1-9, 19, 29, and 30) as follows:

> It is noted that applicants' claimed product is a product-by-process. Although the cited reference does not teach the process steps recited, these process steps are however not given patentable weight since the invention in a product-by-process claim is a product, NOT a process. It is the patentability of the product claimed and NOT the recited process steps which must be established (citations omitted, caps original, underline added).

In this passage, the Examiner states three times that claims 1-9, 19, 29, and 30 are product claims. Now, inexplicably, the Examiner is rejecting new claims 31-43 because they are likewise product claims. Respectfully, the Examiner's argument is nonsensical. Perhaps the use of different preambles in the various product claims is causing confusion. Thus, in an effort to

substantively advance prosecution, Applicants have amended the preamble of the claims to consistently recite a product, which is consistent with the Examiner's assertion above that the claims are product claims. Given that all the pending claims are product claims, Applicants respectfully request that the restriction requirement be withdrawn and pending product claims 1-9, 19, and 29-43 be examined together.

Claim Rejections – 35 USC §112

The specification has been amended to include support for the various language used in the claims to characterize the product. Support for such language is present in Table I of the specification on page 11.

The 112 rejection of claim 1 regarding the relationship of "dimer" and "product" has been addressed in the above remarks to the restriction requirement and related claim amendments.

Claim Rejections – 35 USC §102

Claims 1-9, 19, 29, and 30 (and presumably new claims 31-43) stand rejected under 35 USC § 102(b) as anticipated by *Komoto* (4,069,272). As noted above, the Examiner has taken the position that the pending claims are product claims and that process limitations will not be given patentable weight. Accordingly, Applicants have made amendments and have submitted new claims to fully characterize the claimed products via compositional, rather than process, limitations. Applicants respectfully submit that upon careful examination, each and every element of the compositions set forth in the pending product claims are not disclosed in *Komoto*.

Komoto uses a completely different catalyst system

Applicants respectfully draw the Examiner's attention to the fact that Applicants use as catalyst a transition metal complex (e.g., tridentate bisimine ligands coordinated to iron center or a combination of an iron center and aryl rings, either substituted or unsubstituted, of the type shown

in Fig. 2) activated by an aluminum based co-catalyst (e.g., alumoxane or Lewis acid/trialkylaluminum combinations). In contrast, *Komoto* discloses a catalyst system comprising a complex of bis(1,5-cyclooctadiene) nickel(0) and hexafluoro-2,4-pentanedione. For ease of comparison, Applicants provide herewith Exhibit 1 showing the chemical structures of representative catalysts from Fig. 2 used by Applicants versus the chemical structure of *Komoto* catalysts. As can clearly be seen from this comparison, these are completely different catalyst systems. Quite simply, one skilled in the art would not expect similar products from such dissimilar catalysts, absent a showing of other product similarities (which the Examiner has not made in this instance). Given the fundamental difference in catalyst systems employed and the inherent unpredictability of the catalytic arts, Applicants respectfully submit that the Examiner has not met the initial burden of showing the requisite similarity between the product of *Komoto* and Applicants' product to support a *prima facie* case of anticipation. In fact, the products are dissimilar as explained in more detail here after.

Komoto's product contains less dimer and more unreacted olefins

In comparison to *Komoto*, Applicants' process has improved conversion of olefins to dimers, which results in a product having an increased amount of dimer and a decreased amount of olefinic starting material. This can be clearly seen by comparing the conversion of *Komoto's* example to the conversion achieved in Applicants' examples set forth in Table 1 of the specification. In the example, *Komoto* achieved an "8.5% conversion of 1-hexene to higher olefinic products," which means that 91.5% of the olefinic starting materials remained present in the product. As shown the sixth column from the right in Table 1, Applicants demonstrated a much higher conversion for 1-hexene, with greater than 20% conversion of olefins shown in Examples 1, 4-6, 9-12, 14, 15, 17-21, and 23. In the majority of examples using 1-hexene,

Applicants' conversion is well over double that of *Komoto*. As a result, Applicants' product contains much more of the desired dimer and less of the undesirable, unreacted olefinic starting material. In order to clearly recite this compositional difference in the products, Applicants have amended independent claims 1, 31, 36, and 43 to recite that the product comprises less than about 80 weight percent of the olefinic starting materials. Applicants' amended claims clearly distinguish over *Komoto's* product, which contains 91.5% olefinic starting materials. Thus, Applicants respectfully submit that independent claims 1, 31, 36, and 43, and the remaining claims all of which depend there from, are patentable over *Komoto*.

Komoto's product contains more vinylidene

In comparison to *Komoto*, Applicants' process has improved selectivity to produce the desired linear alpha-olefin dimers, resulting in a product having fewer unwanted components such as vinylidene or tri-substituted olefins produced via side-reactions. *Komoto's* example does not contain information regarding the amounts of such unwanted components. However, Applicants provide herewith as Exhibit 2 a copy of an article from the *Journal of Molecular Catalysts*, 34 (1986) p. 345-54 by Beach et al. ("*Beach*") that provides information as to the composition of a product produced by dimerization of 1-butene using the *Komoto* catalyst. As shown on page 346, *Beach* uses a catalyst prepared from bis(1,5-cyclooctadiene)nickel and hexafluoroacetylacetone (i.e., hexafluoro-2,4-pentanedione), which is the same catalyst used by *Komoto*. *Beach* uses the catalyst to dimerize 1-butene, and the results shown in Table 1 indicate that the resultant total dimer mixture contains 5.1 weight percent 2-ethyl-1-hexene (i.e., vinylidene). Furthermore, Table 1 shows that the total dimer mixture contains 8.3 weight percent cis- + trans-3-methyl-2/3-heptenes, which are isomers of vinylidene (as is shown in Scheme 1 on page 349 of *Beach*). Thus, the total amount of vinylidene produced by *Beach* is 5.1 + 8.3 = 13.4 weight percent. In contrast,

claims 5 and 30-36 recite that the mixed dimers comprise less than about 5 weight percent vinylidene or tri-substitued olefins. Given that Applicants' claimed product has less of the undesired vinylidene than products produced by the catalyst disclosed in *Komoto* (and used by *Beach*), Applicants respectfully submit that claims 5 and 30-36 are patentable over *Komoto*.

In summary, *Komoto* uses a completely different catalyst system, *Komoto's* product contains less dimer and more unreacted olefins, and *Komoto's* product contains more vinylidene than the product recited in the pending claims. Given that *Komoto* does not teach each and every element of the pending claims, claims 1-9, 19, 29, and 30-43 are patentable over the art of record.

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(09/660,450US1)

CONCLUSION

Consideration of the foregoing amendments and remarks, reconsideration of the application, and withdrawal of the rejections and objections is respectfully requested by Applicants. No new matter is introduced by way of the amendment. It is believed that each ground of rejection raised in the Final Office Action dated January 10, 2005 has been fully addressed. If any fee is due as a result of the filing of this paper, please appropriately charge such fee to Deposit Account Number 50-1515 of Conley Rose, P.C., Texas. If a petition for extension of time is necessary in order for this paper to be deemed timely filed, please consider this a petition therefore.

If a telephone conference would facilitate the resolution of any issue or expedite the prosecution of the application, the Examiner is invited to telephone the undersigned at the telephone number given below.

Respectfully submitted,

CONLEY ROSE, P.C.

Date: 3-10-05

Rodney B. Carroll
Reg. No. 39,624

ATTORNEY FOR APPLICANTS

5700 Granite Parkway, Suite 330
Plano, Texas 75024
(972) 731-2288